

4th

5th

6th

7th

8th

Grade  
**6**

**meap**<sup>TM</sup>  
Michigan Educational Assessment Program

# *Item Descriptors*



***MATHEMATICS***  
***FALL 2012***

**MICHIGAN STATE BOARD OF EDUCATION**  
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***NOTE: For each item listed throughout this booklet, the first statement is a summary of the Michigan Grade Level Content Expectation (GLCE) and the second statement is the descriptor for the item's stem or question.***

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Students were instructed to read the directions below silently as the test administrator read them aloud.

## PART 1

### DIRECTIONS:

In this part, you will answer multiple-choice mathematics questions. Some questions will ask you to view a picture, chart, or other mathematics-related information. Use that information with what you know to answer the question. You may **NOT** use a calculator for this part of the test.

You must mark all of your answers in Part 1 of your **Answer Document** with a No. 2 pencil. You may underline, circle, or write in this test booklet to help you, but nothing marked in this test booklet will be scored. No additional paper may be used.

Mark only one answer for each question. Completely fill in the corresponding circle on your **Answer Document**. If you erase an answer, be sure to erase completely. Remember that if you skip a question in the test booklet, you need to skip the answer space for that question on the **Answer Document**. If you are not sure of an answer, mark your **best** choice.

A sample question is provided for you below.

### Sample Multiple-Choice Question:

Marty wants to put 75 CDs into cases. Each case holds exactly 8 CDs. What is the **least** number of cases that Marty will need to hold all his CDs?

- A**    8
- B**    9
- C**    10
- D**    11

For this sample question, the correct answer is **C**. Circle **C** is filled in for the sample question on your **Answer Document**.

Once you have reached the word **STOP** in your test booklet, do **NOT** go on to the next page. If you finish early, you may go back and check your work in Part 1 of the test **ONLY**. Check to make sure that you have answered every question. Do **NOT** look at any other part of the test.

NOTE: The directions for Part 2 are the same as the above instructions, but with calculators allowed.

- 1 N.MR.05.01:** Understand the meaning of division of whole numbers, with and without remainders; relate division to fractions and to repeated subtraction.

Translate division equation to subtraction expression.

- A** incorrect expression
- B** incorrect expression
- C** correct
- D** incorrect expression

- 2 N.MR.05.01:** Understand the meaning of division of whole numbers, with and without remainders; relate division to fractions and to repeated subtraction.

Divide 2-digit number by 1-digit number in context.

- A** incorrect quotient
- B** correct
- C** incorrect quotient
- D** incorrect quotient

- 3 N.MR.05.02:** Relate division of whole numbers with remainders to the form  $a = bq + r$ , e.g., 34 divided by 5 = 6 r 4, so  $5 \times 6 + 4 = 34$ ; note remainder (4) is less than divisor (5).

Identify equation that can check answer to division expression.

- A** negative remainder
- B** correct
- C** remainder greater than divisor
- D** remainder greater than divisor

- 4 N.MR.05.02:** Relate division of whole numbers with remainders to the form  $a = bq + r$ , e.g., 34 divided by 5 = 6 r 4, so  $5 \times 6 + 4 = 34$ ; note remainder (4) is less than divisor (5).

Identify equation that can check answer to division expression.

- A** correct
- B** negative remainder
- C** remainder is greater than divisor
- D** remainder = divisor

- 5 N.MR.05.03:** Write mathematical statements involving division for given situations.

Identify operation in contextualized setting.

- A** added instead of divided
- B** multiplied instead of divided
- C** correct
- D** subtracted instead of divided

- 6 N.MR.05.03:** Write mathematical statements involving division for given situations.

Translate division in context to division expression.

- A** multiplication expression
- B** correct
- C** subtraction expression
- D** addition expression

- 7 N.FL.05.04:** Multiply a multi-digit number by a two-digit number; recognize and be able to explain common computational errors such as not accounting for place value.

Multiply 3-digit number by 2-digit number.

- A** incorrect product
- B** incorrect product
- C** incorrect product
- D** correct

- 8 N.FL.05.04:** Multiply a multi-digit number by a two-digit number; recognize and be able to explain common computational errors such as not accounting for place value.

Multiply 3-digit number by 2-digit number.

- A** correct
- B** incorrect product
- C** incorrect product
- D** incorrect product, used incorrect factor

- 9 N.ME.05.08:** Understand the relative magnitude of ones, tenths, and hundredths and the relationship of each place value to the place to its right, e.g., one is 10 tenths, one tenth is 10 hundredths.

Identify fraction equivalent to given whole number.

- A**  $1 = 10$
- B**  $1 = 1/10$
- C** correct
- D**  $1 = 10/100$

- 10 N.ME.05.11:** Given two fractions, e.g.,  $\frac{1}{2}$  and  $\frac{1}{4}$ , express them as fractions with a common denominator, but not necessarily a least common denominator, e.g.,  $\frac{1}{2} = \frac{4}{8}$  and  $\frac{3}{4} = \frac{6}{8}$ ; use denominators less than 12 or factors of 100.

Identify equivalent fractions.

- A**  $a/b = (a + 1)/(b + 1)$
- B** non-equivalent fractions
- C** correct
- D**  $a/b = (a + 4)/(b + 4)$

- 11 N.ME.05.10:** Understand a fraction as a statement of division, e.g., 2 divided by 3 =  $\frac{2}{3}$ , using simple fractions and pictures to represent.

Translate division expression to fraction.

- A**  $a \div b = b/a$
- B** correct
- C**  $a \div b = b \frac{1}{a}$
- D**  $a \div b = a \frac{1}{b}$

- 12 N.ME.05.10:** Understand a fraction as a statement of division, e.g., 2 divided by 3 =  $\frac{2}{3}$ , using simple fractions and pictures to represent.

Translate fraction to division statement.

- A** correct
- B** reciprocal
- C** subtraction statement
- D** subtraction statement

- 13 N.ME.05.11:** Given two fractions, e.g.,  $\frac{1}{2}$  and  $\frac{1}{4}$ , express them as fractions with a common denominator, but not necessarily a least common denominator, e.g.,  $\frac{1}{2} = \frac{4}{8}$  and  $\frac{3}{4} = \frac{6}{8}$ ; use denominators less than 12 or factors of 100.

Identify equivalent fraction.

- A** non-equivalent fraction
- B**  $a/b = (a - 2)/(b - 2)$
- C** correct
- D**  $a/b = (a + 4)/(b + 4)$

- 14 N.ME.05.11:** Given two fractions, e.g.,  $\frac{1}{2}$  and  $\frac{1}{4}$ , express them as fractions with a common denominator, but not necessarily a least common denominator, e.g.,  $\frac{1}{2} = \frac{4}{8}$  and  $\frac{3}{4} = \frac{6}{8}$ ; use denominators less than 12 or factors of 100.

Identify equivalent fractions.

- A** same numerators, added denominators
- B**  $\frac{a}{b} = \frac{(a + 4)}{(b + 4)}$ ;  $\frac{c}{d} = \frac{(c + 5)}{(d + 5)}$
- C** same numerators, multiplied denominators
- D** correct

- 15 N.ME.05.12:** Find the product of two unit fractions with small denominators using area model.

Identify area model that matches product of unit fractions.

- A** incorrect area model
- B** addition of unit fractions
- C** addition of unit fractions
- D** correct

- 16 N.ME.05.12:** Find the product of two unit fractions with small denominators using area model.

Use area model to multiply unit fractions.

- A** one of the factors
- B** one of the factors
- C** incorrect product
- D** correct

- 17 N.MR.05.13:** Divide a fraction by a whole number and a whole number by a fraction, using simple unit fractions.

Divide unit fraction by whole number.

- A** correct
- B**  $\frac{1}{a} \div b = \frac{1}{(a + b)}$
- C**  $\frac{1}{a} \div b = b \div a$
- D**  $\frac{1}{a} \div b = a \times b$

- 18 N.MR.05.17:** Multiply one-digit and two-digit whole numbers by decimals up to two decimal places.

Multiply whole number by decimal in hundredths.

- A** over by factor of 100
- B** over by factor of 10
- C** correct
- D** under by factor of  $\frac{1}{10}$

- 19 N.FL.05.14:** Add and subtract fractions with unlike denominators through 12 and/or 100, using the common denominator that is the product of the denominators of the 2 fractions, e.g.,  $3/8 + 7/10$ : use 80 as the common denominator.

Subtract given fractions with unlike denominators.

- A** correct denominator, but did not convert numerators
- B** subtracted numerators, added denominators
- C** correct
- D** subtracted numerators and denominators

- 20 N.FL.05.14:** Add and subtract fractions with unlike denominators through 12 and/or 100, using the common denominator that is the product of the denominators of the 2 fractions, e.g.,  $3/8 + 7/10$ : use 80 as the common denominator.

Add fractions by finding a common denominator.

- A** added numerators, multiplied denominators
- B** added numerators and denominators
- C** correct denominator, incorrect numerator
- D** correct

- 21 N.MR.05.15:** Multiply a whole number by powers of 10: 0.01, 0.1, 1, 10, 100, 1000; and identify patterns.

Multiply 2-digit number by decimal in hundredths.

- A** over by factor of 1,000
- B** over by factor of 100
- C** over by factor of 10
- D** correct

- 22 N.MR.05.15:** Multiply a whole number by powers of 10: 0.01, 0.1, 1, 10, 100, 1000; and identify patterns.

Multiply 2-digit number by decimal.

- A** under by factor of 1/100
- B** under by factor of 1/10
- C** correct
- D** over by factor of 10

- 23 N.MR.05.17:** Multiply one-digit and two-digit whole numbers by decimals up to two decimal places.

Multiply 2-digit number by decimal in hundredths.

- A** under by factor of 1/10
- B** correct
- C** over by factor of 10
- D** over by factor of 100



- 24 N.FL.05.18:** Use mathematical statements to represent an applied situation involving addition and subtraction of fractions.

Solve with fractions in context.

- A** missing minuend
- B** added
- C** correct
- D** added

- 25 N.MR.05.17:** Multiply one-digit and two-digit whole numbers by decimals up to two decimal places.

Multiply whole number by decimal in hundredths.

- A** multiplied by tens place but not hundredths place
- B** correct
- C** incorrect product
- D** over by factor of 10

- 26 N.FL.05.18:** Use mathematical statements to represent an applied situation involving addition and subtraction of fractions.

Translate subtraction in context to subtraction expression.

- A** subtrahend minus minuend
- B** correct
- C** addition expression
- D** multiplication expression

- 27 N.MR.05.19:** Solve contextual problems that involve finding sums and differences of fractions with unlike denominators, using knowledge of equivalent fractions.

Subtract fractions from same family in context.

- A** added instead of subtracted
- B** subtracted numerators and denominators
- C** added numerators and denominators
- D** correct

- 28 N.MR.05.19:** Solve contextual problems that involve finding sums and differences of fractions with unlike denominators, using knowledge of equivalent fractions.

Add fractions from same family in context.

- A** multiplied numerators and denominators
- B** added numerators and denominators
- C** correct denominator, but did not convert numerators
- D** correct

- 29 N.MR.05.21:** Solve for the unknown in such equations as:  $1/4 + x = 7/12$ .

Solve for unknown in subtraction equation.

- A** correct
- B** incorrect subtrahend
- C** added minuend to difference
- D** incorrect subtrahend

- 30 N.MR.05.21:** Solve for the unknown in such equations as:  $1/4 + x = 7/12$ .

Solve for unknown in addition equation.

- A** given addend
- B** incorrect addend
- C** correct
- D** given addend + sum

- 31 M.UN.05.04:** Convert measurements of length, weight, area, volume, and time within a given system, using easily manipulated numbers.

Convert pounds to ounces.

- A** correct
- B** 1 pound = 12 ounces
- C** 1 pound = 10 ounces
- D** 1 pound = 4 ounces

- 32 M.UN.05.04:** Convert measurements of length, weight, area, volume, and time within a given system, using easily manipulated numbers.

Convert inches to feet.

- A** under by 1 foot
- B** correct
- C** over by 1 foot
- D** over by 2 feet

- 33 M.UN.05.02:** Know the units of measure of volume: cubic centimeter, cubic meter, cubic inches, cubic feet, cubic yards, and use their abbreviations.

Identify the unit of volume.

- A** unit of mass
- B** unit of area
- C** unit of temperature
- D** correct

- 34 M.UN.05.02:** Know the units of measure of volume: cubic centimeter, cubic meter, cubic inches, cubic feet, cubic yards, and use their abbreviations.

Identify the unit of volume.

- A** unit of length
- B** correct
- C** unit of length
- D** unit of area

- 35 G.TR.05.01:** Associate an angle with a certain amount of turning; know that angles are measured in degrees; understand that 90 degrees, 180 degrees, 270 degrees, and 360 degrees are associated, respectively, with  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and full turns.

Determine the number of degrees that a minute hand on a clock rotated.

- A** incorrect number of degrees
- B** incorrect number of degrees
- C** correct
- D** incorrect number of degrees

- 36 G.TR.05.01:** Associate an angle with a certain amount of turning; know that angles are measured in degrees; understand that 90 degrees, 180 degrees, 270 degrees, and 360 degrees are associated, respectively, with  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and full turns.

Translate turn into degrees.

- A** correct
- B** incorrect measurement
- C** incorrect measurement
- D** incorrect measurement

- 37 G.GS.05.02:** Measure angles with a protractor and classify them as acute, right, obtuse, or straight.

Classify angle type given the graphic of the angle.

- A** incorrect type of angle
- B** correct
- C** incorrect type of angle
- D** incorrect type of angle

- 38 G.GS.05.02:** Measure angles with a protractor and classify them as acute, right, obtuse, or straight.

Determine measure of straight angle.

- A** angle with measure less than that of straight angle
- B** angle with measure less than that of straight angle
- C** correct
- D** angle with measure greater than that of straight angle

- 39 G.GS.05.03:** Identify and name angles on a straight line and vertical angles.

Identify pair of angles that are not vertical angles.

- A** vertical angles
- B** vertical angles
- C** correct
- D** vertical angles

- 40 G.GS.05.02:** Measure angles with a protractor and classify them as acute, right, obtuse, or straight.

Classify angle type given the graphic of angle.

- A** correct
- B** incorrect type of angle
- C** incorrect type of angle
- D** incorrect type of angle

- 41 G.GS.05.04:** Find unknown angles in problems involving angles on a straight line, angles surrounding a point, and vertical angles.

Determine measurement of vertical angle.

- A** complementary angle
- B** correct
- C** twice the value of vertical angle
- D** supplementary angle

- 42 G.GS.05.04:** Find unknown angles in problems involving angles on a straight line, angles surrounding a point, and vertical angles.

Find the value of missing angle on straight line.

- A** measure of straight angle =  $150^\circ$
- B** one of given angles
- C** measure of straight angle =  $170^\circ$
- D** correct

- 43 G.GS.05.04:** Find unknown angles in problems involving angles on a straight line, angles surrounding a point, and vertical angles.

Determine measure of supplementary angle.

- A** measure of straight angle =  $260^\circ$
- B** measure of straight angle =  $220^\circ$
- C** correct
- D** measure of straight angle =  $130^\circ$

- 44 G.GS.05.05:** Know that angles on a straight line add up to 180 degrees and angles surrounding a point add up to 360 degrees; justify informally by "surrounding" a point with angles.

Find measure of angle surrounding a point given 2 other angles.

- A** sum of angles surrounding a point =  $127^\circ$
- B** sum of angles surrounding a point =  $180^\circ$
- C** sum of angles surrounding a point =  $300^\circ$
- D** correct

- 45 G.GS.05.05:** Know that angles on a straight line add up to 180 degrees and angles surrounding a point add up to 360 degrees; justify informally by “surrounding” a point with angles.

Find measure of angle surrounding a point given 3 other angles.

- A** sum of 2 given angles
- B** third given angle
- C** correct
- D** over by 10 degrees

- 46 M.UN.05.04:** Convert measurements of length, weight, area, volume, and time within a given system, using easily manipulated numbers.

Convert quarts to gallons.

- A** 1 gallon = 2 quarts
- B** correct
- C** 1 gallon = 8 quarts
- D** 1 gallon = 16 quarts

- 47 N.FL.05.05:** Solve applied problems involving multiplication and division of whole numbers.

Divide 4-digit number by 2-digit number in context.

- A** incorrect quotient
- B** incorrect quotient
- C** correct
- D** incorrect quotient - rounded remainder less than 0.5 down

- 48 N.FL.05.20:** Solve applied problems involving fractions and decimals; include rounding of answers and checking reasonableness.

Calculate the fractional amount of pizza.

- A** correct
- B** 1/number of pieces eaten
- C** incorrect fraction
- D** complement

- 49 M.UN.05.01:** Recognize the equivalence of 1 liter, 1000 ml and 1000 cubic cm and include conversions among liters, milliliters, and cubic centimeters.

Convert liters to milliliters.

- A** 1 L = 10 mL
- B** 1 L = 100 mL
- C** correct
- D** 1 L = 10,000 mL

- 50 N.FL.05.05:** Solve applied problems involving multiplication and division of whole numbers.

Multiply (or use repeated addition) in context.

- A** subtracted
- B** added
- C** incorrect product
- D** correct

- 51 M.UN.05.01:** Recognize the equivalence of 1 liter, 1000 ml and 1000 cubic cm and include conversions among liters, milliliters, and cubic centimeters.

Convert milliliters to liters.

- A** correct
- B** 1,000 mL = 1 cm<sup>3</sup>
- C** 1,000 mL = 10 L
- D** 1,000 mL = 10 cm<sup>3</sup>

- 52 N.FL.05.20:** Solve applied problems involving fractions and decimals; include rounding of answers and checking reasonableness.

Identify decimal with value closest to given fraction.

- A** complement
- B** correct
- C** over by 0.10
- D** over by 0.16

- 53 M.UN.05.03:** Compare the relative sizes of one cubic inch to one cubic foot, and one cubic centimeter to one cubic meter.

Select greatest volume.

- A** greatest measure, intermediate measurement
- B** least measurement
- C** least measure, intermediate measurement
- D** correct

- 54 M.PS.05.10:** Solve applied problems about the volumes of rectangular prisms using multiplication and division and using the appropriate units.

Calculate volume of rectangular prism.

- A** correct
- B** incorrect volume
- C** incorrect volume
- D** incorrect volume

- 55 M.PS.05.10:** Solve applied problems about the volumes of rectangular prisms using multiplication and division and using the appropriate units.

Identify a measurement for volume.

- A** correct
- B** measurement for length
- C** measurement for length
- D** measurement for area

- 56 D.RE.05.01:** Read and interpret line graphs, and solve problems based on line graphs, e.g., distance-time graphs, and problems with two or three line graphs on same axes, comparing different data.

Interpret line graph to determine greatest rate of increase.

- A** decrease
- B** correct
- C** constant rate
- D** increase, but not greatest increase

- 57 D.RE.05.01:** Read and interpret line graphs, and solve problems based on line graphs, e.g., distance-time graphs, and problems with two or three line graphs on same axes, comparing different data.

Interpret line graph to determine the amount spent.

- A** incorrect year
- B** correct
- C** incorrect year
- D** incorrect year

- 58 D.RE.05.01:** Read and interpret line graphs, and solve problems based on line graphs, e.g., distance-time graphs, and problems with two or three line graphs on same axes, comparing different data.

Interpret line graph to determine change in temperature over time.

- A** correct
- B** used temperature at end of graph, not end of given period of time
- C** y-intercept and starting temperature
- D** temperature at end of period

- 59 D.RE.05.02:** Construct line graphs from tables of data; include axis labels and scale.

Match given table with line graph.

- A** incorrect line graph
- B** incorrect line graph
- C** correct
- D** incorrect line graph

- 60 D.RE.05.02:** Construct line graphs from tables of data; include axis labels and scale.

Match given table with line graph.

- A** correct
- B** incorrect slope, incorrect y-intercept
- C** correct slope, incorrect y-intercept
- D** incorrect slope, incorrect y-intercept

4th

5th

6th

7th

8th



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